John Valentine Mershon
1867 - 1953

Target Approach to Treatment Planning
What comes after the Diagnosis, and Setting of Goals

Before treatment planning, one develops the diagnosis
- Chief Complaint
- Clinical Examination
- Radiograms - Tracings - Radiology Report
- Models (mounted?) or intraoral scans
- Photographs
Three part Chief Complaint

Clinical Examination - beyond the static records
- History
- Facial Balance and Asymmetries, Dental midlines
- TMD and Restricted function, CR-MI
- Dental/Gingival display in speech or on full smile
- Periodontal Status:
- Habits, muscle function
- Family Interactions

Radiology -
Routine for ortho has been 2D Ceph and Pan

Reduce the field of view!
- Vertical Collimation can trim FOV form top or bottom.
- Horizontal Collimation to trim lateral borders.

When CBCT is the best choice
Clinician can reduce the exposure by choosing:
- 2D Ceph + medium FOV CBCT
  - 5 µSv
- ~45 µSv - 3mL voxel

2D HF (4 µSv) + Frontal HF from CBCT
Once the problem list and goals are settled
Move on to the treatment plan

Six Principles of Biocreative Treatment Planning

“SIMPLE IS BEST”

1. Target teeth
2. Alveolar Housing
3. Growth
4. Less Hardware
5. TMJ function
6. Muscle influence

*Prof. Seong Hun (Sunny) Kim  *Prof. Kyu Rhim Chung

Principle #1
Set up your target teeth

A. What are the CCs and goals of the referring dentist, the patient, and the responsible party?
B. Determine which teeth/tooth will need to move the longest distance or take the most time to move? Start moving these teeth first!

Target example
Principle #2 Alveolar housing

- The alveolar housing can limit our treatment goals
- Moving teeth into cortical bone can damage the bone and the teeth
- Trauma to the cortical bone can accelerate tooth movement
- Teeth can be moved into grafted bone
- The alveolar housing can be altered surgically
- High angle Housing & Low Angle Housing

Mandible of deceased 19YOF

- Patient had been undergoing orthodontic treatment
- Resected mandible with dentition used for study
- Records available included T0 cephalogram and models, T1 cephalogram at 19 months TX.

Missing lower left second premolar, retained deciduous second molars
- Deciduous molar removed and the space closed

Mandibular incisors, alveolar bone, and symphysis after orthodontic treatment. A retrospective study. 
Veinbank, Bauer, and Dietrich 

Symphysis in T0 cephalogram

Symphysis in T1 cephalogram
Incisor retraction can cause lingual dehiscence and loss of labial plate

Or. Both plates are perforated

1mm slice vs 10 mm slice

Translation and Bone

Alveolar Housing Example #2

Nga Hoang UCSF 2013 thesis
Alveolar Housing Example #3
Adult premolar extraction
Modifying Alveolar Housing

- Corticotomy
- Bone grafting
- Osteotomy
Corticotomy Assisted Decompensation

*Seong Hun Kim et. al, AJO-DO Nov 2011

First advance the lower incisors then set back the mandible

Another example to procline anterior segment


Osteotomy
Principle #4 Less Hardware

Chung, Nelson, Kim, Kock, AJO DO July 2007
Comparing Bone Borne Expander to Tooth Borne

Bone Borne v Tooth Borne

- Greater transverse skeletal expansion
- Less alveolar bone bending
- Less dental tipping
- Less vertical alveolar buccal bone loss
- Transverse dimension of spacers ...

Principle #6 Muscle Balance

- Low tongue posture is more important than swallow (Takada & Lowe J Dent Research October 1986)
- Low tongue posture is raised with RPE (Iwasaki, et al, AJODO February 2013)
- Tongue position raises with surgery (JDDO Changes of hyoid bone and tongue with advancement surgery journal Volume 57, Issue 4, April 1984, Pages 351-356)
More things we know about muscle balance

- Extractions help close the open bite (Stability of anterior open bite extraction... Jasmon et al Volume 129, Issue 6, June 2006, Pages 768-774)
- Open bite treatment with aligners is effective (Guarnieri Open bite treatment using aligners Angle Orthodontist, Vol 83, No 5, 2013)
- Mandibular tongue Elevator might be the best retention

More things

- Oromyofunctional therapy dramatically improves stability (Smith, paper, Cognat, May 2010 AJODO) 21 patients vs control of 39 patients. Used a tongue target to aid perception.
- Lower lingual spurs help close bite (Bisco, Justus AJODO Oct 2013)

We Reviewed 4 of 6 Principles of Biocreative Treatment Planning

1. Target teeth
2. Alveolar Housing
3. Growth
4. Minimum Hardware
5. TMJ Function
6. Muscle influence

*Prof. Seong Hun (Sunny) Kim  *Prof. Kyu Rhim Chung
Enjoy San Francisco!

California Street Stairway Tile Project

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Thank You!

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